Name_____ Date_____

AE Chemistry
Graphing Atmospheric Data

Look at the data presented in the table below, it contains information about the several parts of the atmosphere around us.

Atmospheric Data				
Altitude (km)	Temperature (^{o}C)	Pressure (mm Hg)	Mass (g) in a 1 L Sample	Number of air molecules in a 1 L sample
0	20	760	1.20	250 x10^{20}
5	-12	407	0.75	150 x10^{20}
10	-45	218	0.40	90 x10^{20}
12	-60	170	0.35	77 x10^{20}
20	-53	62	0.13	27 x10^{20}
30	-38	18	0.035	7 x10^{20}
40	-18	5	0.009	2 x10^{20}
50	2	1.5	0.003	0.5 x10^{20}
60	-26	0.5	0.0007	0.2 x10^{20}
80	-87	0.03	0.00007	0.02 x10^{20}

1. Predict the shape of the graph line for a plot of

    a. Temperature vs. Altitude
    b. Pressure vs. Altitude

2. Prepare graphs according to the instructions below:

    a. For the first graph, plot temperature versus altitude data. Your teacher will help you with the scale.

    b. For the second graph, plot pressure versus altitude data. Your teacher will help you with the scale.

    c. Draw a best-fit line through the points of each graph. (Note the line may be straight or curved.)

3. Does the shape of either graph differ from what you predicted in Question 1? If so, how?

4. a. Compare the ways in which air temperature and air pressure change with increasing elevation.
    b. Which follows a more regular pattern?
    c. Offer an explanation for this regular pattern.

5. Based on this graph data would you expect air pressure to rise or fall if you traveled from sea level (0 km) to:

    a. Death Valley (86 m below sea-level)
    b. Pike's Peak (4301 m above sea-level)

6. Suppose you took one-liter samples of air at several altitudes. How would the following change?

    a. mass of the air sample
    b. number of molecules in the air sample
    c. Draw a sketch of how these variables change with altitude.

7. Scientists often characterize the atmosphere as having four layers in the following order: Troposphere (nearest Earth), Stratosphere, Mesosphere, and the Thermosphere (outermost layer). Look at the temperature vs altitude plot. Draw lines and label where you think each layer might be.